100TH CONGRESS
1st Session

HOUSE OF REPRESENTATIVES

REPORT
100-98

NATIONAL BUREAU OF STANDARDS AUTHORIZATION ACT FOR FISCAL YEAR 1988

MAY 19, 1987.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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Mr. ROE, from the Committee on Science, Space, and Technology, submitted the following

REPORT

together with

MINORITY VIEWS

[To accompany H.R. 2160]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 2160) to authorize appropriations to the Secretary of Commerce for the programs of the National Bureau of Standards for fiscal year 1988, and for other purposes, having considered the same, report favorably thereon without amendment and recommend that the bill do pass.

CONTENTS

	Page
I. Summary of Committee Actions	2
Budget Total	2
Budget and Other Actions	3
A. National Bureau of Standards Authorization (NBS)	3
B. Office of Productivity, Technology and Innovation (OPTI)	3
C. National Technical Information Service (NTIS)	3
Other Committee Actions	4
NBS Organic Amendments	4
Miscellaneous Provisions	4
Purpose of the Bill	5
Comparison with Budget Request	5
II. Committee Actions, Fiscal Year 1988	5
A. National Bureau of Standards Budget Actions	5
Measurement Research and Standards	6
Materials Science and Engineering	7

H703-3

Page

Engineering Measurements and Standards 7
Computer Sciences and Technology 7
Research Support Activities 8
Cold Neutron Source Facility Construction 9
B. Other Budget Actions 10
Office of Productivity, Technology and Innovation 10
National Technical Information Service 10
Japanese Technical Literature 11
C. Other Actions 12
Fully and Currently Informed 12
Research Associates 12
User Fees/Adjustment of Fee Schedules 13
Assessment of Emerging Technologies 14
Technology Transfer for Small Business 15
National Technical Information Service Privatization 15
Commerce Science Fellowship Program 16
III. Sectional Analysis of the Bill as Reported 17
IV. Committee Views 19
Other Administration Initiatives 19
High Performance Composites 20
Lightwave Measurement Technology/Fiber Optics 20
Process and Quality Control 21
Verification of Engineering Data Bases 22
Steel Technology 22
Center for Fire Research 23
Center for Building Technology 23
Technical Competence Fund 24
Alternate Personnel System 25
The National Bureau of Standards and Competitiveness 26
Automated Manufacturing Research Facility 27
Superconductivity Research and Measurement Capabilities 28
Post-Doctoral Research Associates 29
Computer Sciences and Technology 29
Computer Security 30
Metric Conversion 30
Cooperation between the National Bureau of Standards and the National Science Foundation 31
V. Oversight Activities 32
VI. Oversight Findings and Recommendations by the Committee on Government Operations 32
VII. Budget Analysis and Projection 33
VIII. Cost Estimate of Congressional Budget Office 33
IX. Effect of Legislation on Inflation 34
X. Changes in Existing Law 35
XI. Committee Recommendation 36
XII. Administration Views 36
XIII. Minority Views 41

I. SUMMARY OF COMMITTEE ACTIONS

Budget Total

The President's budget request for fiscal year 1988 included $138,625,000 for the National Bureau of Standards; $2,218,000 for the Office of Productivity, Technology and Innovation; and zero funding for the National Technical Information Service, for a total for programs covered by this authorization of $140,843,000. This represents a $16,625,000 increase for the National Bureau of Standards; a $102,000 decrease for the Office of Productivity, Technology, and Innovation; and a $432,000 decrease for the National Technical Information Service from the funds appropriated in Fiscal Year 1987.

H.R. 2160, as reported by the Committee, includes $142,997,000 for the National Bureau of Standards; $2,400,000 for the Office of Productivity, Technology and Innovation; and $500,000 for the National Technical Information Service. For the Bureau, the total reflects the President's request of $138,625,000 plus the Committee's restoration of funding for the fire and building safety programs. In the case of the Office of Productivity, Technology and Innovation, the sum of $2,400,000 restores this effort to the Fiscal Year 1987 level of services. For the National Technical Information Service the sum of $500,000 places funding for the Patent Licensing Program at a level slightly above the Fiscal Year 1987 appropriation figure.

Budget and Other Actions

A. NATIONAL BUREAU OF STANDARDS AUTHORIZATION

H.R. 2160, as reported, authorizes $142,997,000 for the National Bureau of Standards. This total includes all the initiatives proposed by the Administration for the Bureau, including: $3,550,000 for process and quality control; $1,500,000 for high performance composites; $750,000 for bioprocess engineering; $500,000 for lightwave measurement technology (including fiber optics); $500,000 for computerized reference data; and $13,200,000 in adjustments to base. The Committee agrees with the 14 percent increase in funding proposed for the Bureau while noting that only 2.4 percent is for programmatic enhancements. The Committee does not accept the decrease proposed for the fire and building research programs, and has restored funding of $4,372,000 for these safety programs. The Committee also moved $500,000 out of research support activities and into superconductivity research.

A separate line item has been established by the Committee for funding of the Cold Neutron Source Facility in the amount of $6,500,000.

The bill also includes exclusive authorization amounts of $2,000,000 for steel technology; $3,710,000 for the Center for Building Technology; $5,662,000 for the Center for Fire Research (with specific instructions that the two centers not be merged); and $7,371,000 for the technical competence fund.

B. OFFICE OF PRODUCTIVITY, TECHNOLOGY AND INNOVATION (OPTI)

For Fiscal Year 1988, the bill authorizes the sum of $2,400,000 for the Office of Productivity, Technology and Innovation. This amount continues the OPTI programs at approximately the Fiscal Year 1986 and 1987 appropriation level, and is $182,000 above the Administration's Fiscal Year 1988 request for OPTI.

C. NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)

For Fiscal Year 1988, the bill authorizes $500,000 for the patent licensing activities within the National Technical Information Service.

Other Committee Actions

NBS Organic Act Amendments

1. Computer Science and Technology.—Section 9 of the bill amends the Organic Act by adding language authorizing the Bureau to develop standards to advance the effective use of computers and to protect the information stored, processed and transmitted by those systems.

2. Fully and Currently Informed.—Section 10 of the bill adds a new section to the Organic Act specifying that the Director of the National Bureau of Standards keep the appropriate authorizing committees of the House and Senate informed of all activities of the Bureau.

Miscellaneous Provisions

1. Line Item Transfers.—Section 2(c) of the bill includes language which would provide a limit of 10 percent on the funds to be transferred between line items upon notice of NBS's House and Senate authorizing committees, and a supplemental procedure for transfers to or from line items in excess of 10 percent.

2. Japanese Technical Literature.—Section 5 of the bill authorizes the appropriation of $1,000,000 to implement the Japanese Technical Literature Act of 1986.

3. Cold Neutron Source Facility.—Section 6 of the bill includes a provision authorizing the appropriations of funds authorized but not appropriated for the Cold Neutron Source Facility for Fiscal Year 1987. It also authorizes NBS to accept and retain any contributions, regardless of the Fiscal Year, as needed for construction of the facility.

4. Salary Adjustments.—Section 7 of the bill authorizes the appropriation of additional funds for adjustments in salary, retirement, and other employee benefits.

5. Availability of Appropriations.—Section 8 of the bill specifies that funds appropriated under this Act shall remain available as specified in the Appropriation Act.

6. Research Associates.—Section 11 of the bill specifies that the Bureau cannot charge Research Associates user fees without statutory authority to do so.

7. Adjustments to Fee Schedules.—Section 12 of the bill specifies that the Bureau cannot raise fees for standard references and calibration services without justification to Congress.

8. Assessment of Emerging Technologies.—Section 13 of the bill requires the Board of Assessment of the National Bureau of Standards to assess emerging requirements in metrology as part of its annual review of NBS programs.

9. Improve Technology Transfer With Small Businesses.—Section 14 of the bill directs the Bureau to prepare a plan detailing how NBS will make small businesses more aware of its activities.

10. Performance of the Activities of the National Technical Information Service.—Section 15 of the bill forbids the further contracting out of activities of the National Technical Information Service without legislative authority.

11. Commerce Science and Technology Fellowship Program.—Section 16 of the bill reestablishes within the Department of Com-

merce a Commerce Science and Technology Fellowship Program to provide certain Executive Branch employees with the opportunity of a work experience in other agencies or the Congress.

Purpose of the Bill

The purpose of the bill is to authorize appropriations for Fiscal Year 1988 to the National Bureau of Standards and related agencies in the amount of $146,897,000 out of the money in the Treasury not otherwise appropriated.

Comparison With Budget Request

Committee actions on the President's budget request for the National Bureau of Standards and other programs contained in the bill are reflected in the table below:

NATIONAL BUREAU OF STANDARDS AND RELATED AGENCIES—HISTORY OF 1988 BUDGET REQUEST

[In thousands of dollars]

Activity	President's request to Congress	Subcommittee action	Change from President's request	Fiscal year 1987 appropriation	Change from 1987 appropriation
Measures research and standards	43,196	43,196	0	36,598	+6,598
Process and Quality Control	[3,550]	(3,550)			
Computerized Reference Data	[500]	(500)			
Materials science and engineering	24,557	24,557	0	21,339	+3,218
High-Performance Composites	[1,500]	(1,500)			
Steel		(2,000)			
Engineering measurements and standards	35,347	40,219	+4,872	35,831	+4,388
[Fiber-Optics]	[500]	(500)			
[Microwave Performance Measurements]					
[Bioprocess Engineering]	[750]	(750)			
(Center for Building Technology)	[5,000]	(3,710)			
(Center for Fire Research)		(5,662)			
(Superconductivity)		(500)			
Computer sciences and technology	8,266	8,266	0	7,500	+766
[Advanced Information Systems]					
[ICST]	[8,266]	(8,266)			
Research support activities	27,259	[1] 26,759	−500	[1] 20,732	+6,027
[Research Associates]	[1,102]	(1,102)			
[Technical Competence]	(7,371)	(7,371)			
Cold Neutron Facility	[6,500]	[6,500]			
NBS Total	138,625	142,997	+4,372	122,000	+20,997
Office of Productivity, Technology and Innovation	2,218	2,400	+182	2,218	+182
National Technical Information Service	0	500	+500	500	0
Japanese Technical Literature Program	0	1,000	+1,000	0	+1,000

[1] Includes Cold Neutron Facility.

II. COMMITTEE ACTIONS, FISCAL YEAR 1988

A. NATIONAL BUREAU OF STANDARDS BUDGET ACTIONS

The National Bureau of Standards (NBS), the nation's oldest national laboratory, is responsible for the measurement foundation which supports the U.S. industrial, government, and scientific establishments. Measurement is the principal means for assuring quality and cost-competitiveness of high technology products and services.

This mission takes on special significance now as the country faces serious competitive challenges to its industry and manufacturing. Measurement is vital in all segments of the industrial economy from new technologies like advanced ceramics, automated manufacturing, cryoelectronics, optoelectronics, and biotechnology to more traditional fields such as communications, steel, and chemicals. In particular, measurements and data are essential for shortening the time between laboratory success and successful product introduction. If U.S. industry cannot make products with increasing precision, we will lose more and more markets to overseas competitors.

The increase for the Bureau in the Administration's proposed budget for fiscal year 1988 represents a reversal of the funding trend of the past several years. While most of the funds go for inflationary increases, for environmental site work, and for implementation of the new Federal employee retirement system, the Bureau is also permitted very modest beginnings for a number of important programs. The Committee sincerely hopes the FY 1988 budget request for NBS is the prelude to substantial increases in the coming years, both for NBS's programs which aid basic industry and also for NBS efforts to develop the capability to aid emerging high technology industries.

The Committee appreciates the cooperation shown by the Department of Commerce and the National Bureau of Standards as it carried out its reponsibilities of assessing the NBS authorization request. To help the Committee fulfill its legislative responsibilities, the Committee continues to expect a complete financial disclosure, including a complete budget history table to be submitted as part of, and at the same time as, the National Bureau of Standards budget book.

Line Item Authorization

The authorization for the National Bureau of Standards is provided in six separate line items in Section 2 of the bill. These line items correspond to the major categories of the Bureau's total program, and are described below.

Measurement Research and Standards

Sec. 2(a)(1) provides for direct appropriations of $43,196,000 to the National Measurement Laboratory, which is responsible for maintenance, development, and measurement. This is the same amount as requested by the Administration in fiscal year 1988, including the $3,550,000 increase for process control and quality assurance projects and $500,000 for computerized reference data. Research in physics, radiation, analytical chemistry, and chemical properties and processes produces fundamental measurement knowledge which enables industry and science to achieve levels of accuracy and compatibility that they require in the laboratory, during production, and in buying and selling. For example, very precise measurement of the speed of light and laser frequencies has allowed NBS to tie all measurements of time, frequency and length to a single, very precise standard. The new definition allows the radiation from stabilized lasers to be used for dimensional measurements in the user's own facility, thus improving process quality

and enhancing productivity. The work of the National Measurement Laboratory is discussed further in Committee Views on Process and Quality Control and on Verification of Engineering Data Bases.

Materials Science and Engineering

The Institute of Materials Science and Engineering carries out the work authorized in section 2(a)(2) by providing measurements, data, standards, reference materials, and other technical information fundamental to the processing and performance of materials. This line item is authorized at $24,557,000 which is at the Administration's request level and includes the $1,500,000 increase for high-performance composites. Research in materials characterization, nondestructive evaluation, metallurgy, metals processing, polymers, composites, and ceramics produces organized data and technical know-how which permit more rapid industrial adoption of new materials that should contribute to improved productivity and competitiveness. For example, NBS is developing measurement techniques, data, theory and predictive models related to the rapid solidification of metal powders thus removing roadblocks to the application of these materials in high-speed machine tools, engines for aircraft, and turbines for power generation. The work of the Institute is discussed further in Committee Views on High Performance Composites and on Steel Technology.

Engineering Measurements and Standards

Section 2(a)(3) authorizes $40,219,000 for the National Engineering Laboratory. This is $4,372,000 more than the Administration's request and reflects the Committee's decision to restore funding for the Center for Fire Research and the Center for Building Technology to fiscal year 1987 levels to effort and to redirect $500,000 from Research Support Activities into NBS's work on superconductivity. The Committee's rationales for these changes are found in the Committee Views Section of this report. This line item also includes the Administration's budget increases of $750,000 for bioprocess engineering, and $500,000 for lightwave measurement. The research associate programs serve as an excellent information exchange system and recruitment vehicle. The work of the Laboratory is discussed further in Committee Views on Lightwave Measurement Technology, on the Center for Fire Research, on the Center for Building Technology, on the Automated Manufacturing Research Facility, and on Superconductivity Research.

Computer Sciences and Technology

Section 2(a)(4) authorizes $8,266,000 for the Institute for Computer Sciences and Technology (ICST). ICST conducts research and provides technical support to the Federal Government, state and local governments, and the private sector in the effective use of computers and computer networks.

The computer industry is a $150 billion per year industry with a positive trade balance, but international competition will become increasingly intense. Innovations in computer hardware and software will challenge managers to apply new technology for productivity increases throughout the American economy in the coming

years and will have pervasive effects on industry structure and performance as well as on the quality of government services. Since small computers will be distributed throughout the workplace and computers will be used generally throughout government and the economy, computer-intergration, performance-assurance, and security will become much more important. For fiscal year 1988 NBS computer research and standards programs will focus on:

Developing standards and test methods to support dstributed and integrated systems such as real-time industrial automation and office communications.

Developing meaurement techniques for measuring the performance of advanced computer technology, including procedures for evaluating office systems, expert systems, and applications development techniques.

Studying ways to improve the quality, reliability, and maintainability of software.

Developing fundamental understanding that will provide a basis for computer security, data integrity, and risk management.

Developing standards and test methods for data and graphics exchange and computer-to-peripheral interfaces.

Assisting federal agencies in solving specific computer-related problems and introducing technology for improving productivity and service delivery (including performance measures for speech recognition systems and the evaluation of software for matching fingerprints and exchanging indentification information).

The work of the Institute is discussed further in the Committee Views on Computer Sciences and Technology and on Computer Security.

Research Support Activities

Funds authorized in section 2(a)(5) are for research supported requirements that are common to all parts of the NBS. These include a technical competence fund, research associate program, bureauwide computing support, facilities modifications and improvements and transfers to the working capital fund. A total of $20,259,000 is authorized for this purpose.

The Committee's authorization level is $7,000,000 lower than the $27,259,000 in the Administration budget because the Cold Neutron Facility is listed separately in section 2(a)(6) and because $500,000 has been reallocated from facilities modification to superconductivity work. Section 6, in addition, continues the availability into fiscal year 1988 of $2,000,000 which was authorized but not appropriated for the Cold Neutron Source Facility for fiscal year 1987. This is further described in the Committee Views section. The Committee separated the Cold Neutron Source Facility from the Central Technical Support line to avoid co-mingling of operating and construction funds. A description of the programs in this area follows:

The technical competence fund is used by the NBS to ensure that the Bureau has the underlying knowledge and skills necessary to meet the responsibilities included in its enabling legislation, other legislation, and administrative directives. The

fund pays for establishment of areas of technical excellence through long-term research responsive to outside technological developments and for seed money for new programs udnertaken in response to changing national needs. See the Committee View on the Technical Competence Fund for a further discussion.

The research associate program consists of the industrial research associates, postdoctoral research associates, and graduate cooperative education participants. These components have the direct effect of maintaining NBS competence by making available each year more than 150 high caliber but low cost scientists and engineers for ongoing research programs and providing a mechanism to technology transfer of NBS research and methods to the scientific and engineering communities. The research associate progams serve as an excellent information exchange system and recruitment vehicle. See the Committee view on the Research Associate Program for a further discussion.

The computing support program, which includes a Class VI Supercomputer system, provides central computing facilities for all NBS programs and for the National Oceanographic and Atmospheric Administration's Environmental Research Laboratories. This equipment has become the central component of the consolidated computing system for NBS and NOAA/ERL. See the Committee Views section for Committee expectations regarding this system.

The facilities modifications and improvements program provides regular improvements, replacements, and modifications to existing laboratories and buildings. The goals of this program are to ensure a safe working environment for employees, avoid costly interruptions to the technical programs, improve operational capabilities, and maintain existing buildings for facilities in proper condition.

Transfers to the working capital fund ensure that sufficient funds are available for investment in depreciable equipment and inventories of materials offered for sale by NBS.

Cold Neutron Source Facility Construction

Section (2)(a)(6) authorizes an additional $6,500,000 in FY 1988 funds construction of the Cold Neutron Source Facility while Section 6 continues the availability of FY 1987 authorizations for the Cold Neutron Sources Facility into FY 1988.

The Committee continues to view the construction of a research facility which can take advantage of the Cold Neutron Source, which is now being installed in the NBS research reactor as very important and regrets that the Administration has continually coupled this project with cuts in the budget of the Center for Fire Research and Center for Building Technology. The increased need for this powerful tool of materials science has been well documented. Cold neutrons are irreplaceable in the investigation of a number of organic and inorganic materials, including composites, alloys, and polymers, which directly affect the international competitiveness of U.S. industry. The Europeans have operational cold neutron test facilities and are building more, and the Japanese are developing

such a capability, spending several times the amount proposed by NBS. The importance of this project is clearly indicated by the fact that the National Academly of Sciences in 1984 identified a cold neutron facility as the number one priority for materials research in our country today.

NBS proposes to develop this as a national user facility, with two thirds of its operating time reserved for the general research community and scheduled by a Program Advisory Committee, the majority of whose members would come from outside the NBS. NBS also plans to solicit industry support for one third of the instrumentation. This is an outstanding example of government-industry-university cooperation in large-scale research.

The Committee recognizes the need for the Cold Neutron Research Facility and is fully supportive of its development plan, including the construction of the building and the guide tubes to pipe the cold neutrons from the reactor to the buildings, as long as other on-going programs at the Bureau are not reduced to fund this facility. The Cold Neutron Research Facility is an ongoing construction project, whose integrity stands on it own merits. However, since ground has yet to be broken, it would be less destructive if NBS delayed this construction project a little longer, than to weaken ongoing NBS operations. Therefore, for fiscal year 1988 the Committee authorizes an additional $6,500,000 for the Cold Neutron Research Facility for a total authorization level to date of $13,000,000. Given the great scientific importance of this facility, the Committee hopes that full appropriations for the Cold Neutron Research Facility can be made against both its fiscal 1987 and the fiscal 1988 authorizations.

B. OTHER BUDGET ACTIONS

Office of Productivity, Technology and Innovation

Section 3 authorizies $2,400,000 for the Office of Productivity, Technology, and Innovation of the Department of Commerce.

The Committee is disappointed that once again the Administration has proposed drastic reductions for OPTI in spite of the critical role it plays as an advocate for the enhancement of technological innovation and productivity in this country. OPTI is vital in maintaining a sensitivity within the Department of Commerce to the special needs of small business and the role it plays in technology innovation. It is also vital in the role it plays as a catalyst in the transfer of technology from our federal laboratories to the industrial world. The savings involved in the phase-out of the Office are miniscule compared to the potential benefits to our economic growth, the development of new jobs, and the competitiveness of our industry internationally.

Therefore, the Committee continues to support funding of OPTI until such time as the Administration comes up with an adequate plan for redistribution of OPTI's vital functions.

National Technical Information Service

The Committee has provided $500,000 to continue the patent licensing activities of the National Technical Information Service

(NTIS). A similar level of appropriations in fiscal year 1986 led to over $4,000,000 bearing returned to the Treasury.

NTIS acts as the patent licensing agent for federal agencies that do not have their own patient licensing operations. With the exception of the National Institutes of Health (NIH), these are generally agencies with relatively small research budgets, such as the Bureau of Mines and the Environmental Protection Agency.

In fiscal year 1986, NTIS issued 50 royalty bearing licenses to businesses that pledged to spend over $100 million commercializing the inventions. That year, NTIS collected $5 million in royalties, but most were generated by two NIH discoveries—tests for malaria and for Acquired Immune Deficiency Syndrom (AIDS). With the exception of NIH, no agencies' invention currently generate enough income to over the associated NTIS program costs.

Until fiscal year 1987, the revenues collected by NTIS were returned to the general fund of the Treasury Department, except for 15 percent which are returned to the inventors. However, under the Technology Transfer Act of 1986, the revenues that had been returned to the Treasury Department will instead return to the agency in which the invention originated. NRIS, therefore, still needs appropriated funds to continue its activities.

The work of NTIS ensures that as many federal inventions as possible will be transferred to the private sector for commercialization without requiring every agency to staff identical bureaucracies. The agencies that use NTIS have shown little inclination to set up programs of their own. Small agencies will never have the economies of scale necessary to justify worldwide patenting and licensing operations. While some agencies pay NTIS for its services, most are unwilling to earmark funds for that purpose. The long lag between licensing and commercialization—an average of five to eight years—further dampens agency interest.

NTIS is of particular benefit to small businesses, which do not have the means to monitor the panoply of federal research programs. NTIS makes a special effort to seek out small businesses that are capable of commercializing inventions. Small businesses traditionally receive more than half of NTIS licenses.

Japanese Technical Literature .

The Committee bill authorizes the sum of $1,000,000 for fiscal year 1988 to continue the activities authorized in the Japanese Technical Literature Act of 1986. This is the same amount provided in the 1986 Act for fiscal year 1987. Therefore, the Committee expects the Department of Commerce to expand and strengthen these efforts in fiscal year 1988 including increased cooperation with both the public and private sectors.

The Committee continues to be concerned about the imbalance in the exchange of scientific and technical information between the United States and Japan. Significant advances in science and technology, along with a national policy of emphasis on R&D, are expected to continue in Japan in the coming years.

If the U.S. is to remain internationally competitive, the Committee believes it is important to monitor Japanese technical developments and to increase substantially the availability of Japanese sci-

ence and engineering literature to United States scientists and engineers.

The Committee is also pleased with the increased emphasis the Administration is placing on foreign scientific and technical information as evidenced by section 4 of the April 10, 1987 Executive Order. The Committee urges the Secretary of Commerce to avoid duplication by utilizing fully the strengths of the National Technical Information Service in carrying out information dissemination responsibilities under Section 4(c) of that order.

C. OTHER ACTIONS

Fully and Currently Informed

Section 10 of the bill specifies that the NBS Director shall keep the appropriate authorizing committees of the House and Senate informed on all activities of the Bureau.

The Committee takes seriously its responsibilities under the House rules for the oversight and authorization of National Bureau of Standards (NBS) programs. The Committee cannot fulfill its obligations in the absence of complete information on the Executive Branch's actions regarding these programs. While for the most part the Committee has experienced excellent cooperation from the NBS and the Department of Commerce (DOC), there have been times, such as the attempt to consolidate the public affairs programs of the DOC, when important plans or actions were not provided to the Committee in a timely manner. Therefore, a mandate to keep the Committee fully and currently informed on the activities of the NBS is added to permanent law as part of this year's authorization to erase any doubt regarding the responsibilities of Commerce Department and Bureau officials on their own initiative, to alert the Committee to important actions being contemplated and to provide the Committee with all the information necessary for responsible oversight. This action will conform this statute to others under the jurisdiction of the Committee which already contain the requirement.

Research Associates

Section 11 of the bill contains a ban on charging fees to research associates in the absence of express statutory authority to do so. This section does not apply to contracts between NBS and other organizations for cooperative research and development which require cash contributions as part of the private sector's contribution to the project funding.

Through their votes on the Technology Transfer Act of 1986, both the House and the Senate unanimously affirmed their belief that cooperative research and development between national laboratories, such as the National Bureau of Standards (NBS) and the rest of the nation's research community, is of critical importance. There is a strong consensus in the Congress that this means of bringing together government and private sector researchers is of paramount importance. The Committee is pleased that through the April 10, 1987 Executive Order the Administration has also thoroughly endorsed this concept.

The Committee views the research associates program of the NBS as one of the better examples of successful cooperative research. Under this program large and small businesses, universities, professional societies, and other organizations donate the services of scientists and engineers in their employ. They pay salary benefits and living expenses while the research associate works for NBS. NBS, in turn, donates the laboratory space and research materials as required. In some instances, companies have also donated equipment and the use of their own industrial facilities.

The Committee believes the current arrangement works well, and as a general rule, does not feel that it should be changed. While industry gains the benefit of having its employees intimately familiar with the work being done at the NBS, there are tremendous advantages for the Bureau as well. The Bureau receives highly qualified labor at no cost and has no ongoing financial obligation to the researcher after a specific project is completed. The research associates provide a constant influx of the latest thinking in a particular field and expose NBS scientists and engineers first hand to the needs of the Bureau's customers.

The Committee fears that the imposition of fees on research associates will reduce the number of companies willing to loan personnel to the Bureau. The Committee is especially concerned about the impact such fees may have on small business which is interested in increasing rather than decreasing the input of these organizations into NBS's work.

Another reason for not requiring fees from research associates is the Administration's desire that such associations be a two-way street and the undesirability of having the Federal government pay to lend its own researchers to private or university laboratories. The Committee notes that under the April 10, 1987 Executive Order, the Executive Director of the President's Commission on Executive Exchange is directed to assist Federal agencies by developing and implementing an exchange program whereby scientists and engineers in the private sector may take temporary assignments in Federal laboratories and vice versa. The Committee believes that NBS could gain much from temporary assignments of NBS researchers to private companies and other research organizations which use NBS services. This would permit NBS scientists and engineers to have first-hand knowledge of the way in which NBS products or services are used by industry and of the needs particular industries face which could be addressed by new NBS products and services. The Committee, therefore, encourages NBS management to participate as fully as appropriate in this and similar exchange programs.

User Fees/Adjustment of Fee Schedules

Section 12 of the bill limits NBS's ability to raise fees for its standard reference materials and calibration services.

The National Bureau of Standards' (NBS) pricing schedule for standard reference materials and calibration services has been thought out carefully and has stood the test of time. The Committee is therefore reluctant to see major changes made in this system.

Currently, a very clear distinction is made between the research and development costs which lead to new standard reference mate-

rials and the cost of producing these materials for sale by the National Bureau of Standards. The Committee believes that it is appropriate to use appropriated funds of either the National Bureau of Standards or a mission agency to pay the research and development costs for new standard reference materials and services while charging NBS customers a fee which recovers the incremental costs of producing the specific standard reference materials or calibration services they buy. The National Bureau of Standards is already a highpriced national calibration laboratory by world standards. Standards laboratories of other nations tend to subsidize production of standard reference materials in addition to paying for the research.

The scope of the NBS calibration and standard reference material program is proof that the program is working well. NBS customers are willing to pay the current prices charged for NBS products, even though they cost more than the standard reference materials of other countries; NBS standard reference materials and calibrations are of such uniform high quality that they currently command a premium price. These primary standard reference materials, in turn, are replicated in a secondary U.S. private sector measurement market which provides considerably cheaper but somewhat less precise measurement services to the general public.

In 1983 the NBS was asked by the Office of Management and Budget to raise prices of standard reference materials and calibration services substantially. These price increases led to a drop in sales of standard reference materials and calibration services. Large businesses continued to spend the same dollar amounts on standard reference materials but purchased smaller quantities. Many smaller businesses, state and local governments and nonprofit institutions were priced out of the market for standard reference materials and calibration services. This experience shows that there is not much room for higher charges for these materials and that small businesses, which have the most difficulty competing in world markets, are going to be those who suffer from arbitrary price increases. The Committee, therefore, concludes that changes in fee structures should be subject to a 30 day layover period at the Congress before going into effect. The Committee expects that the justification accompanying any such request will be based on a careful examination of the market for these services and will take into account the special needs of small businesses, universities and other non-profit organizations.

Standard reference materials and calibration services are two of the more important underpinnings of the competitiveness of American businesses. The Committee, therefore, expects NBS to continue to provide these materials and services as a service rather than as a business and to price these materials in a manner which ensures wide availability of the materials and services rather than on the basis of recovery of all costs associated with their development.

Assessment of Emerging Technologies

Section 13 of the bill revises the Congressional requirements regarding NBS's Board of Assesement's review of emerging metrology needs.

The Committee is pleased with the enthusiasm that the Board of Assessment of the National Bureau of Standards' programs has shown by including as part of its annual review an assessment of emerging technologies which are expected to require research in metrology. The Committee believes that the Board of Assessment's panelists bring a unique perspective to the Bureau which is valuable, far beyond review of past and existing programs. Therefore, the Committee requests that the assessment panels incorporate into their periodic review of Bureau programs careful consideration of areas where the Bureau must build competence either through expansion of existing efforts or through the development of new capabilities necessary to prepare to meet industry's metrology needs in the 1990's. These suggestions should include cost estimates of the programs and services that NBS must add to remain the world's premier standards laboratory.

Technology Transfer for Small Businesses

Section 14 of the bill directs the Bureau to prepare a plan detailing how NBS will make small businesses more aware of its activities.

The Committee believes that the small business sector plays an extremely important part in innovation and productivity in this country, and that it could play an even larger role with the proper resources. However, at authorization hearings before the Subcommittee on Science, Research and Technology on March 3, 1987, both the Bureau's Director and the Chairman of the Visiting Committee, acknowledged that the Bureau has had little success transferring technology to small business. At the hearing and in subsequent conversations, Bureau officials have said interaction with small business requires a more local presence; small businesses are too diverse, too widely distributed and too financially strapped to be reached by traditional programs of the Bureau.

Accordingly, the Committee directs that the NBS submit a plan to the authorizing Committees in the House and Senate detailing how the Bureau will make small businesses more aware of NBS activities, and how it will attempt to increase small businesses' participation in NBS research and technology transfer programs and application of the Bureau's research to small business, particularly in manufacturing. In developing the plan, the Bureau should consider how to overcome this handicap, through such means as working with the existing state economic development programs at all levels of government and the Federal Laboratory Consortium for Techlology Transfer. The plan should also state the number of research associates and participants in the Automated Manufacturing Research Facility from small business. The plan shall inlude specific cost estimates and implementation schedules for each proposed activity. The plan is to be submitted not later than October 1, 1987.

National Technical Information Service Privitization

Section 15 of the bill forbids the contracting out of additional activities of the National Technical Information Service (NTIS) without specific statutory authority.

The Committee finds it difficult to justify either the privatization of NTIS or further contracting out of its functions. Numerous A–76 reviews of specific portions of NTIS have been conducted including five during the Reagan years, and a major study on NTIS privatization was completed by the Department of Commerce in October 1986. Each of these studies concluded that NTIS functions can be performed most economically using the current organizational and funding arrangements. Furthermore, the October 1986 study raised dozens of unanswered questions about the consequences of turning NTIS over to the private sector. Why would foreign countries be willing to continue to give documents to NTIS if it were a subsidiary of a for profit U.S. company? Who would pay the termination costs and other costs related to the change in NTIS? Should foreign companies be prohibited from bidding on NTIS or should a successful U.S. bidder be prohibited from, in turn, selling NTIS to a foreign company? Is there any company which is willing to take over all of NTIS's functions? Will U.S. agencies continue giving documents voluntarily to NTIS if it is owned by a private company? Would a private company be willing to continue NTIS archival functions and technology transfer functions? Would a private NTIS charge much higher fees to users for the services they are now receiving? Would a private NTIS continue supplying documents to the depository library system?

Unless these and other questions can be answered, it is doubtful that Congress would approve major changes in the way NTIS does business other than to restructure NTIS as a government corporation. However, the Committee is willing to consider proposals to improve NTIS; the Administration is requested to formally submit to the Committee by December 31, 1987 its list of recommended improvements in the way that NTIS does business.

Commerce Science Fellowship Program

Section 16 of the bill, the Department of Commerce's Science and Technology Fellowship Program is reestablished within the Department of Commerce by this legislation. The program, which was traditionally administered by the National Bureau of Standards, provides a select group of employees of the Department of Commerce and other Executive branch agencies the opportunity of learning, through work experiences of up to one year, how the Legislative Branch and other parts of the Executive Branch function.

The Secretary has wide latitude in the length and scope of assignments covered by the program. While assignments of six months to a year are desirable for assignments in the House or Senate, the Committee realizes that it may be difficult for agencies to spare certain key employees for that long a period. Therefore, no minimum time is placed on a fellowship. The one-year cap is placed on the program to assure that employees return to their agencies within a reasonable time bringing back the increased knowledge and experience the program has provided.

The duty to establish a program and to report to the Congress rests with the Secretary rather than the Bureau. The Secretary is free to delegate this responsibility wherever he wishes within the Department, although scientific agencies like the National Bureau of Standards, the National Technical Information Service, the

Office of Productivity, Technology, and Innovation, or the National Oceanic and Atmospheric Administration are the most logical homes for the program. The Secretary is free to charge such fees to the home agencies of fellows or applicants as are necessary to cover the program's administrative costs.

III. SECTIONAL ANALYSIS OF THE BILL AS REPORTED H.R. 2160

A bill to authorize appropriations to the Secretary of Commerce for the programs of the National Bureau of Standards for Fiscal Year 1988 and for other purposes.

SECTION 1

This section provides the short bill title "National Bureau of Standards Authorization Act for fiscal year 1988".

SECTION 2

This section authorizes appropriations for the National Bureau of Standards for Fiscal Year 1988 in the amount of $142,997,000. The individual line items of the NBS budget are authorized as follows:

(1) Measurement and Research Standards	$43,196,000
(2) Materials Science and Engineering	24,557,000
(3) Engineering Measurement and Standards	40,219,000
(4) Computer Science and Technology	8,266,000
(5) Research Support Activities	20,259,000
(6) Cold Neutron Source Facility	6,500,000

Line items 1, 2, and 4 are authorized at Administration request levels; except for a $500,000 transfer to line 3 for superconductivity activities, items 5 and 6 are also at the request level, but are not combined as in the request; item 3 is increased to permit full funding of the Center for Fire Research and the Center for Building Technology in accordance with the compromise reached with OMB in October 1986.

This section also sets authorization floors for certain activities: of funds authorized for Materials Science and Engineering, $2 million is authorized only for steel technology; of the funds authorized for Engineering Measurements and Standards, $3.71 million is authorized only for the Center for Building Technology, and $5.662 million is authorized only for the Center for Fire Research with the stipulation that the two centers shall not be merged; and of the funds authorized for Research Support Activities, $7.371 million is authorized only for the Technical Competence Fund.

Section 2 also permits funds to be transferred among the line items provided that the net funds transferred do not exceed 10% of the amount authorized for that line item and that advance notification is provided to the appropriate House and Senate Committees.

Finally, this section also authorizes that the Secretary may propose transfer to any line item in excess of 10% provided that 1) a full written explanation and reason for the transfer is submitted to the Speaker of the House, the President of the Senate, and the appropriate authorizing committees of the House of Representatives and the Senate and 2) the transfer is made only when 30 calendar days have passed since the transmission of the written explanation.

SECTION 3

This section authorizes the sum of $2,400,000 for the activities of the Office of Productivity, Technology, and Innovation for Fiscal Year 1988. This is the level the Committee feels is required to guarantee that OPTI maintains its traditional level of services.

SECTION 4

This section authorized the sum of $500,000 for the patent licensing activities of the National Technical Information Service, permitting activities to continue at the current level of effort.

SECTION 5

This section authorizes the sum of $1,000,000 for the Japanese Technical Literature Act of 1986 for FY 1988 activities, the same level as was provided in the Act of FY 1986.

SECTION 6

This section provides that funds authorized but not appropriated for the Cold Neutron Source Facility for Fiscal Year 1987 can be appropriated in Fiscal Year 1988.

SECTION 7

This section authorizes such sums as are necessary for Fiscal Year 1988 for each of the above programs for adjustments in salaries, retirement, and other employee benefits. The intent of this section is to allow such adjustments during FY 1988 to be paid for from supplemental appropriations rather than from reductions in level of effort in the programs.

SECTION 8

This section permits the length of availability of funds appropriated under authorizations provided by this Act to be determined in appropriations acts.

SECTION 9

This section amends the Organic Act of March 3, 1901 (15 U.S.C. 274) for the purpose of adding to the list of activities which the National Bureau of Standards specifically may undertake research leading to standards and test methods to advance the effectiveness of computer and related systems and to protect the information stored, processes, and transmitted by those systems. The Bureau's Institute for Computer Sciences and Technology is already engaged in these activities using statutory responsibilities delegated to it by the Secretary of Commerce. The addition of these words ends any doubt that the Congress intends NBS to be actively involved in computer standards work.

SECTION 10

This section amends the Act of March 3, 1901 to provide that the Director of the NBS keep the appropriate committees of the House and Senate fully and currently informed of the activities of the National Bureau of Standards.

SECTION 11

This section stipulates that the National Bureau of Standards shall not charge fees to research associates in the absense of express statutory authority to do so. The section's intent is to encourage greater exchange of researchers between NBS and other U.S. laboratories of all kinds.

SECTION 12

This section provides that the Director of NBS must justify in writing all proposed changes in fees for currently offered standard reference materials and calibration services unless such changes are being made solely to adjust for changed costs of raw materials, of labor, or of producing and delivering standard reference materials and calibration services.

SECTION 13

This section directs the Board of Assessment of the NBS to include, as part of tis reviews of NBS programs, an assessment of emerging technologies that require research in metrology. This section focuses the assessment panels on NBS's future as well as on the quality of current NBS programs.

SECTION 14

This section directs the Bureau to prepare a plan detailing how NBS will make small businesses more aware of its activities and to increase small business application of NBS's research.

SECTION 15

This section prohibits the National Technical Information Service from contracting out or privatizing any of its activities or functions that are not currently performed by contractors, unless such contracting out or privatization is specifically authorized by statute.

SECTION 16

This section establishes the Department of Commerce Science and Technology Fellowship Program to provide employees of the Department of Commerce and other Executive Branch employees with the opportunity of learning how the legislative branch and other parts of the executive branch functions.

IV. COMMITTEE VIEWS

Other Administration Initiatives

COMMITTEE VIEW

During the past three fiscal years, the Committee has authorized the National Bureau of Standards to begin several new high technology initiatives. The needs addressed by the new initiatives were great, but paying for these initiatives without increasing the overall NBS budget has caused the Bureau to be spread very thinly.

There is now considerable concern in the scientific community that the Bureau is over-extended and unable to remain at the cutting edge in many of the projects which it has undertaken. One prominent witness stated that it would be much better for the Bureau to be doing state-of-the-art work in a few areas than to be a few years out-of-date in a much larger number of technologies. The Committee therefore suggests that for the fiscal year 1989 budget the Administration consider reviewing the programs which are already underway to make sure that adequate funding has been provided before it proposes further new initiatives.

High Performance Composites

Committee View

The Committee supports the Administration's proposed increase in high performance composites research at the Bureau. The U.S. now has the technological lead in the application of high performance composites to defense and aerospace needs, but this lead has not been translated to other commercial markets. U.S. industries face intense competition from Western Europe and Japan where process technologies aimed at commercial markets are being developed rapidly. In order to remain internationally competitive, it is necessary to develop reliable methods and standards required by U.S. industry to produce and use high performance composite materials. The Committee hopes this program will be expanded beyond initial polymers work into metal/metal composites in the near future.

Lightwave Measurement Technology/Fiber Optics

COMMITTEE VIEW

The Committee supports NBS efforts to develop a meaningful program in fiber optics and lightwave measurement realizing that there is tremendous need for enhanced measurement capabilities along much of the ligh spectrum. The Committee, however, notes that even with this increase the Bureau's program will be funded at about 25 percent of the original NBS estimaters of the cost of a well-rounded program of research related to lightwave metrology.

The Committee understands that the work of characterizing fiber is largely completed. However, the Committee views as extremely important the work now under way regarding the balance of fiber optics systems and the work to permit precise measurements with submicron accuracy required for the use of photonic based computer chips. NBS can make tremendous contributions through this program to both the computer and communications industries. Therefore, the Committee urges the Administration to review carefully the future needs for measurement in the various lightwave regimes and to provide sufficient funds for NBS research so the calibration services will be available when needed.

Process and Quality Control

COMMITTEE VIEW

The Committee views very favorably the decision of the Administration to request for fiscal year 1988 the next increment of the NBS process and quality control initiative. This program is integrally related to NBS's contribution to the competitiveness of American industry. The standard reference materials and calibration services which result from this research give the Nation's industrial standards laboratories the precise measurements they replicate for private industry. Without these measurements, it would be impossible for industry to manufacture many products within the specifications required by today's marketplace.

Current NBS resources are insufficient to improve and deliver services to established measurement areas and at the same time to develop new services to meet emerging quality control needs. Some companies feel they are missing important business opportunities because the standards they need to assure the quality of specific products are not available. The specific research and development projects included in this initiative were identified by national organizations and endorsed by a panel of industrial and government experts. They are important in keeping up the momentum of the revitatization of NBS's calibration services program which to many in industry is the core of the NBS mission. However, they address only a fraction of the recommendations for NBS in this area and a much smaller percentage of the needs identified by affected industries. Therefore, this enhancement will help only marginally unless a much larger effort is made to identify and meet industry's needs in this area.

The Committee has included process and quality control technologies on a list of technologies it is requiring the NBS Board of Assessments to review regarding program content and budget. It also, in P.L. 99-574, instructed the Director of NBS to initiate discussions with concerned industries and agencies to work out a comprehensive solution to this industrial measurement problem. The Committee had hoped that the review would occur in advance of the FY 1988 budget submission. However, it recognizes the magnitude of this task and looks forward to receiving this information including possible solutions in the near future.

The Committee also notes that the Institute of Electrical and Electronics Engineers and the National Conference of Standards Laboratories have done extensive surveys of needs for calibration services and standard reference materials and have come up with some creative suggestions on how the NBS might stretch limited resources. The Committee urges the Bureau to enter discussions with these organizations regarding their ideas for cooperative research, for purchase of standards, and for drawing upon the expertise of standards laboratories in other countries.

Verification of Engineering Data Bases

COMMITTEE VIEW

The Committee is pleased that this year's budget request includes $500,000 to support a pilot program to produce selected computerized standard reference data bases. The Committee agrees that such computerized data bases would offer U.S. scientists and engineers rapid access to reliable technical data. The Committee further hopes that there will be a dramatic expansion of this program in fiscal year 1989 and subsequent years. There is probably no other NBS activity which has suffered more from the inadequate funding of recent years. One expert witness who testified before the Committee estimated that roughly $20 million dollars for each of the next 10 years would have to be spent on validation and computerization of the engineering data base to get the NBS to the point where it could provide needed data in all major fields.

The U.S. clearly pays the price every day of not having access to the most up to date engineering data. Commercial products of all types have to be overdesigned to compensate for data which may or may not be accurate. This $200 million dollar total investment (i.e. $20 million per year for 10 years) could save billions every year through elimination of wasteful overdesign and through increased quality in American goods and services.

Steel Technology

COMMITTEE VIEW

The Committee is pleased with the current effort of the National Bureau of Standards in steel technology and expects a minimum of $2,000,000 of the funds available to the National Bureau of Standards for fiscal year 1988 to be made available for steel-related activities. This restores the steel program to its fiscal year 1986 funding level, which should guarantee that the fiscal year 1988 effort is at least as great as the fiscal year 1987 NBS effort in steel technology.

On March 11, 1980, the General Research Committee of the American Iron and Steel Institute formed a task group to formulate a plan of research and development relevant to process control and sensor development for the steel industry. The task force included 13 member companies; 537 research needs were identified. After a ranking process by individual member companies, the list was reduced to 18, of which 4 were treated as top prirority. The activities begun at the National Bureau of Standards led to a briefing/workshop at NBS in 1982 on process control sensors for the steel industry. This workshop was attended by 160 people. Cooperation between the steel industry and NBS has continued ever since.

The President's Science Advisor, in February 1984, began work with industry, universities, the Department of Energy, and representatives of certain national laboratories on a plan to use the expertise of national laboratories to conduct research into leapfrog technologies for the steel industries that would increase productivity beyond that of foreign competition. Most of the proposed funding for this program was recommended for the Department of Energy,

but the activities at the Bureau have been the first to get underway. The Committee endorses this research program for both agencies and feels that it should go forward withour further delay.

Center for Fire Research

COMMITTEE VIEW

The Center for Fire Research (CFR) conducts the only comprehensive programs of fire research in the United States. Most of the basic fire research performed in this country is either conducted or funded by this Center. Its research program provides the scientific and technical basis for efforts to reduce the Nation's fire losses and the cost of fire protection. It focuses on reducing the problem of residential fires, which account for the majority of fire-related deaths and injuries in the United States. Because of these fires, the U.S. has one of the world's highest fire death rates, over twice that of most industrialized countries.

The Center is also mandated under P.L. 93-498, the Federal Fire Prevention and Control Act of 1974, to perform and support research on all aspects of fire, with the aim of providing scientific and technical knowledge applicable to preventing and controlling fires. This requires the following program at the Center: (1) basic and applied fire research for the purpose of understanding the fundamental processes underlying all aspects of fire; (2) research into the biological, physiological, effects of fire and human behavior during fires; and (3) operational tests, demonstration projects, and fire investigations in support of these activities, as set forth in the Fire Act.

In fiscal year 1977 a fire research grant program, which has been conducted by the National Science Foundation since 1971, was transferred to the CFR. The grant program brings the talents of world-class researchers from many fields to focus on fire research, and is the predominant supporter of fundamental fire research in the U.S. Since most of the grants are to universities, the program also supports much of the advanced training that produces new generations of fire researchers. The Committee views continuation of the CFR and its grants program as essential and, in the absence of firm commitments from industry to assume more of the costs of these programs, recommends continuation of its funding at a level of $5,662,000. This level is consistent with the agreement reached in October 1986 by OMB and NBS's Congressional authorizing committees on the size of the fire program for the balance of this Administration. The Committee also opposes the proposed merger of the Center for Fire Research and the Center for Building Technology and has prohibited such a merger during fiscal year 1988. The missions of each Center is discrete and important. The Committee feels they must be maintained as separate entities to guarantee that both missions receive proper emphasis.

Center for Building Technology

COMMITTEE VIEW

The Committee continues to support the Center for Building Technology. Research conducted at this center provides the techni-

cal basis for voluntary standards, building codes, and specifications by developing improved measurement techniques, test methods, and technical data, none of which would be available otherwise. The Committee is pleased that after 4 years of proposed elimination, some funds appear for the Center in NBS's request for fiscal year 1988; it regrets that the Administration feels unable to honor its commitment to propose the full level of funding contained in the October 1986 compromise between OMB and NBS's Congressional authorizing committees.

The Committee continues to believe that the National Bureau of Standards is in a unique position to provide unbiased and pertinent information in this field, and that private sector and state and local governments with their 13,500 building codes and jurisdictions either cannot or will not carry out the non-proprietary technical research needed. As an example, a recent accomplishment of the Center has been researched leading to revision of the National One and Two Family Dwelling Model Building Code, which the National Association of Home Builders estimates will result in a cost reduction of $550 per dwelling unit constructed. The need for more federally funded construction research has been further documented in a report of the National Research Council entitled "Construction Productivity" which was released in January 1987.

The NBS is the only federal laboratory with the capability to investigate the physical causes of major building and construction failures, such as the office building collapse in Bridgeport, Connecticut, and to disseminate the results promptly so as to avoid future occurrences like these tragic failures. We were likewise fortunate to have the Center for Building Technology available to investigate the construction of the U.S. Embassy building in Moscow.

The Center also has a key role to play in the National Earthquake Hazards Reduction Program; it provides research and technical suppport for development of seismic design and construction building code provisions. In addition, federal agencies such as the General Services Administration, Federal Emergency Management Agency, and the Department of Energy as well rely on the NBS as a authoritative laboratory resource for their building research needs. Therefore, the Committee has restored funding in the amount of $3.71 million for the Center for Building Technology to bring total funding into compliance with the October agreement. The Center is also discussed in Committee Report on the reauthorization of the National Earthquake Hazards Reduction Act.

Technical Competence Fund

COMMITTEE VIEW

The report of the White House Science Council-Federal Laboratory Review Panel (Packard Report) recommended that laboratory directors have 5 to 10 percent of their budgets in a discretionary account to give research personnel the flexibility and freedom they need to produce innovations which are important but which may not be of high priority to those monitoring programs from outside the laboratory. Since NBS's total budget (direct plus reimbursable funding) for fiscal year 1988 is likely to be between $240 million and $250 million, the 5 to 10 percent discretionary account recom-

mended by the Packard panel would total $12,000,000 to $25,000,000 per year for NBS. However, the NBS Technical Competence Fund request totals just $7,371,000 for fiscal year 1988, a reduction of 20 percent from fiscal year 1986.

The recent breakthroughs in superconductivity illustrate why the Bureau needs a larger Technical Competence Fund. The superconductivity program has been reduced in recent years because more than a decade had passed since the last breakthrough. Now in the last 6 months, new superconductive materials have been produced which raise the superconductivity threshhold so high that they are being hailed as the most revolutionary discovery since the transistor. There is a great worry that the U.S. may not be able to commercialize its discoveries in these fields, so many companies and certain government agencies are beginning to devote major resources to the field. The prototypes of superconductive wires and other products are already being developed. Increased NBS calibration and measurement services in superconductivity will soon be needed, but NBS's competence fund resources are spread too thinly for a meaningful research program to be put together or even for state-of-the-art equipment to be provided to the superconductivity researchers NBS does have. This is not the first time that NBS's lack of resources has proven to be a potential barrier to competitiveness of U.S. industry.

On the other hand, if the Director had an additional $10 to $15 million available in discretionary funds, he would be able to direct resources toward major breakthroughs or technological advances in the laboratory when they occur. These discretionary funds are especially important at NBS because this laboratory's timely delivery of standards or lack thereof can make or break industry. Therefore, the Committee urges NBS to consider moderate competence fund increases in fiscal year 1989 and subsequent years until the fund totals at least 5 percent of the total Bureau budget.

Alternate Personnel System

COMMITTEE VIEW

The Committee continues to support strongly the implementation of an alternate personnel system at the National Bureau of Standards (NBS). The Committee is deeply concerned about the large number of NBS scientific and technical personnel who are eligible for retirement over the next five years. NBS's level of success in replacing these individuals will determine the quality and reputation of the NBS for years to come. These retirements come at a time when the NBS has not been competitive in the salaries it can offer to key employees. Starting salary offers at the NBS have run on the average about $10,000 behind those made by industry. While mid-career salaries have tended to be more competitive, top level salaries at the Bureau have also lagged badly behind the private sector. The problem has been more severe in some parts of the Bureau than in others. The Bureau has experienced extreme difficulty in attracting the appropriate individuals in the most competitive fields, such as computer and materials science, where NBS

often has been only able to pay half of what industry pays to individuals with comparable skills and experience.

The Committee expects work on implementation of the alternate personnel system to continue and the deadlines for the programs which are contained in P.L. 99-574 to be met. The Committee also expects the emphasis of the program to be on using the new authority contained in P.L. 99-574 to establish an exemplary personnel system which can be used at other important, government-operated federal laboratories. Since this is a five year experiment, emphasis should be on showing whether these new authorities successfully can be used to rebuild a major federal laboratory and to help it through a demographic crisis; the emphasis should not be on holding down personnel costs.

P.L. 99-574 calls for cost neutrality during Fiscal Year 1987. The purpose of this provision is to avoid a situation in which all employees of the NBS receive pay raises as the new personnel system is put into place. Congress did not mandate that the program be cost neutral for Fiscal Year 1988 and subsequent years, and it is unlikely that the program as envisioned by Congress can be cost neutral. The experiments at China Lake and The Naval Ocean Systems Command were not cost neutral, and these two experiments did not have to confront the high cost of living or the competition for scientists and engineers in the Washington, D.C. area. The authorization bill, this year as usual, allows for reprogramming of up to 10 percent of NBS's line items without prior Congressional notification. It is hoped that this authority will be used to make sure that money is available to make all necessary salary adjustments, to pay employment and retention bonuses, and otherwise to ensure that the NBS has the consistently high quality workforce it needs to continue as the world's premier standards laboratory.

The Committee requests that the NBS take steps to overcome problems associated with the loss of selected key employees with unique skills who are near retirement. The Committee considers the NBS's high quality workforce to be its most important asset and, therefore, urges the Bureau to make the most of its alternate personnel authority and to set an example that other laboratories can emulate.

The National Bureau of Standards and Competitiveness

COMMITTEE VIEW

It is hard to think of another Federal Government agency which dollar for dollar has as great an impact on our Nation's competitiveness in domestic and world markets. The precision of measurements tied directly to NBS standards determine the limit of quality that U.S. products can achieve. If American businesses cannot measure within required tolerances, their products will clearly be inferior and lose markets to the products of nations which can.

The increases in the Fiscal Year 1988 authorization bill for NBS, as reported by the Committee on Science, Space, and Technology, are modest and must be viewed as only the first step in revitalizing the NBS. Several witnesses have testified in recent hearings that NBS direct appropriations would have to total at least $200 million before NBS has the resources necessary to live up to its potential.

This expansion should focus on three problem areas. First, systematic verification of the Nation's engineering data base is long overdue and a comprehensive program of data validation and universal availability is badly needed. Second, a major increase is now needed in the process and quality control program of NBS. The development of new standard reference materials and calibration services should be delayed no longer. Third, in recent years NBS has undertaken perhaps a dozen new initiatives to help emerging industries develop an adequate standards base. An NBS official estimated while testifying before the Committee that these programs are funded at about 10 percent of total needs.

NBS, together with industry, must develop comprehensive programs in each of these areas, if NBS, at the conclusion of this revitalization program is to have the vitality to allow U.S. industry to hold its own in existing markets and to absorb its fair share of markets of the future.

The Committee further notes that several of the sections of the April 10, 1987 Executive Order on competitiveness are directly applicable to the National Bureau of Standards. The Committee requests that NBS report to it by September 30, 1987 on its implementation of Section 1 of that order and on how it can participate under Section 2, Section 3, and Section 6 of that order.

Automated Manufacturing Research Facility

COMMITTEE VIEW

One promising solution to the manufacturing dilemma, and one that only a few companies have attempted so far, is automation of the production process. Improvements in manufacturing processes will provide the capability to ensure the production of consistently high-quality goods, the ability to make cost-effective products, and the flexibility to respond rapidly to marketplace changes. We must call on all of our talent in materials, electronics, computers, robotics, and manufacturing if we are to be competitive in all fields of manufacturing.

At the Bureau, the focal point for measurement and standards work related to automation is the "factory of the future", the Automated Manufacturing Research Facility (AMRF). The AMRF is a research form of an advanced flexible manufacturing system made up of robots and machine tools working together under computer control.

A cooperative industry-university-government project, the AMRF has received substantial funding from the U.S. Navy, and $3.5 million in equipment has been loaned or donated by industry. Thirty-eight research associates from industry and researchers from 20 universities work collaboratively with NBS staff on various aspects of the AMRF.

The AMRF is addressing two critical problems in computer-integrated manufacturing, the basis of the factory of the future. The first problem is to get robots, computers, and machine tools from different manufacturers to communicate and work together in an integrated system. The second is to find a means for implementing quality control in a fully automated factory environment.

A solution to the first problem is the development of interface standards for the many devices, including the robots, machine tools, sensors, controllers, and computers, which make up an automated factory system. Such standards permit manufacturers of automated equipment to design and build interfaces for their products that protect the proprietary aspects of these products while allowing them to work with those of other manufacturers.

Center researchers also are working on a solution to the second problem, how to implement a quality control program in a fully automated factory. They are devising the means to automatically monitor and control the manufacturing process so parts are made right the first time. Within the AMRF, researchers have designed and implemented measurement techniques for such process control.

With the proper dissemination and application, lessons learned from the AMRF can help improve U.S. manufacturing productivity and the attractiveness abroad of goods made in the U.S. The Committee is pleased with AMRF's efforts to date, but is concerned about the level of automated manufacturing knowledge of smaller manufacturers. The Committee urges the Bureau to look for ways to spread the results of its work throughout manufacturing especially to smaller manufacturers and to report back to the Committee on the current level of small business collaboration at the facility.

Superconductivity Research and Measurement Capabilities

COMMITTEE VIEW

In allocating an additional $500,000 to the superconductivity work on the National Bureau of Standards (NBS), the Committee recognizes that the recent breakthroughs in superconducting materials hold out the promise of extraordinary new products of great economic significance. These products will be the subject of intense international competition for lucrative world markets. Japan has already mounted a significant effort to develop new superconducting materials and new products based on those materials. NBS can accelerate U.S. development of competitive products by providing the measurement capability and materials data that industry must have to succeed at rapid R&D and commercialization.

Superconductivity advances will increase the speed of computers and microelectronics equipment, and greatly enhance the efficiency of large-scale electrical products, generators, and motors. Scientfic benefits are also in the offering, ranging from new instruments of extraordinary sensitivity to better magnets for medical research and diagnosis, fusion research, and high energy physics.

The Committee notes that the NBS can significantly accelerate the efforts of U.S. industry to make use of superconductivity breakthroughs by providing measurement methods and materials data critical to all stages of research, development, and marketing. The Bureau can provide the greatly needed measurements for characterizing the properties of the new superconducting materials, for designing new products, for controlling manufacturing processes, for testing final products, and for proving the performance of those products in the international marketplace. With $500,000 of addi-

tional funding, NBS will begin to provide these urgently needed measurements and data.

At the same time, the Committee recognizes that these funds should be viewed only as a beginning for the superconductivity work NBS needs to do. Accordingly, the Committee requests that the NBS submit a plan of its proposed activities in superconductivity to the Committee no later than October 1, 1987. The plan should outline the areas of research, characterization, testing, and measurement of new materials that the NBS should undertake in order to keep the United States at the forefront of superconductivity research and development.

Post-Doctoral Research Associates

COMMITTEE VIEW

Among reductions that were proposed in the Administration's fiscal year 1987 budget for the National Bureau of Standards, there is none which the Committee felt to be more ill-advised than the elimination of over half of the Bureau's post-doctoral research associates, including the entire postdoctoral class which would have begun work on fiscal year 1987.

The Commttee finds the post-doctoral program to be a valuable means to attract and screen candidates for the permanent staff of the Bureau, just as it is at many other Federal laboratories. Therefore, the Committee included in the authorizing legislation, which became P.L. 99–574, an amendment to the Bureau's Organic Act, establishing a legislative mandate for a permanent Post-Doctoral Fellowship program. The Committee, therefore, expects the Bureau to recruit a full class of Post-Doctoral Research associates in fiscal year 1988 and in each subsequent year. The Committee recognizes that the line item in NBS's budget entitled Post-Doctoral Fellowship Program does not cover the entire cost of the program and expects NBS to find the rest of the costs in other program funds using its reprogramming authority as necessary.

Computer Sciences and Technology

COMMITTEE VIEW

The Committee reaffirms its belief that the mission of the Institute for Computer Sciences and Technolgoy (ICST) is essential to development and implementation of a coherent national set of information processing standards, and to the management of Federal information sources. The Committee believes that the ICST plays an important role in increasing the competitivenss of U.S. computer and data communications products and services and in increasing the acceptance of international standards compatible with U.S. computer and data communication technology. The Committee also recognizes the importance of the ICST's activities to management of the government's substantial investment in information processing technology and feels that the Institute should undertake a full complement of projects within its mission area. The Committee is pleased that ICST was not targeted for reduction this year and hopes that in fiscal year 1989 and beyond it will be considered on a

par with the other high technology programs of NBS which the Administration has been promoting in recent years.

Computer Security

COMMITTEE VIEW

The Committee chose not to increase the authorization level for NBS's computer security program in advance of passage of the Computer Security Act of 1987. A final decision on the scope of NBS's functions under that Act must be reached before it will be possible to decide additional budget or resources these new reponsibilities will require. Testimony received by the Committee during 1986 estimated that these responsibilities would be in the range of $3 million dollars. However, the broadening of the definition of computers under the 1986 Brooks Act amendments and realignment of responsibilities between NBS and the National Security Agency probably will require NBS's computer security budget to be somewhat higher.

The Committee is convinced that this will be money well spent. Government-wide implementation of NBS's current knowledge about computer security would probably save taxpayers hundreds of millions of dollars a year through a marked reduction in computer-related fraud. Therefore, the Committee urges, after passage of the Computer Security Act, that the Administration allocate to the Bureau the resources necessary to implement this program even if this requires a supplemental appropriation. The likely dollar savings from reduced fraud are too great to forefit or delay by being miserly in the allocation of computer security funds to the NBS.

Metric Conversion

COMMITTEE VIEW

The metric system has become the official language of international trade. This past year, the country of Brunei converted to the metric system, leaving the United States as the only non-metric industrialized country in the world. Burma is the only third world country which is equivocal in its commitment to metric.

Given the crushing negative U.S. trade balance, and the increased need for competitiveness, the Department of Commerce must be encouraged to continue to help U.S. business, especially small business, to overcome the burdens of metric "illiteracy" in order to be able to compete on an equal footing with overseas competitors. U.S. business is at risk of losing substantial sales opportunites by not being able to supply metric products, and the situtation will only get worse as our potential overseas customers become less and less willing to accept non-metric products.

Yet, the Office of Productivity, Technology, and Innovation's (OPTI) Office of Metric Programs, the official coordinating point within the Federal Government for support of companies voluntarily expanding their use of the metric system, is proposed for dramatic reductions, in the proposed fiscal year 1988 budget with no indication as to the future of metric coordination within the Federal Government.

Accordingly, the Committee recommends that OPTI as a minimum continue its current level of effort in metric and that the Department of Commerce continue to coordinate voluntary governmental metric activities through the Office of Metric Programs. If we are serious as a nation about increasing the competitiveness of U.S. goods and services in world markets within the limited funds of the Department of Commerce, we must increase, not decrease, the services OPTI provides to U.S. manufacturers who must compete for sales in metric-dominated markets.

Cooperation Between the National Bureau of Standards and the National Science Foundation

COMMITTEE VIEW

The Committee recognizes the unique role of the National Science Foundation (NSF) in funding important and imaginative research efforts that help keep the United States at the forefront of science and technology in the world. The Committee also recognizes the equally important roles of the National Bureau of Standards (NBS) in basic research pushing back the frontiers of measurement science and in providing the technical standards and measurement capabilities that are essential when translating these ideas into new commercial products and improved manufacturing processes. The Committee urges NSF and NBS to explore opportunities for cooperation in this effort in some of their numerous fields of common interest, thereby, taking advantage of NBS's unique access to the manufacturing sector of our economy and NSF's multitude of contacts in the university community.

The Committee notes that President Reagan in his Executive Order of April 10, 1987 entitled Facilitating Access to Science and Technology requires the head of each agency "to examine the potential for including the establishment of university research centers in engineering, science, or technology in the strategy and planning for any future research and development programs." These centers are to "focus on areas of fundamental research and technology that are both scientifically promising and have the potential to contribute to the Nation's long-term economic competitiveness." The Committee looks favorable on NBS and NSF cooperating in these efforts. The Joint Institute for Laboratory Astrophysics (JILA), located on the campus of the University of Colorado at Boulder, is a highly successful example of the good which can come from the combination of the unique strengths of the National Bureau of Standards and a major university assisted by start-up funds from the National Science Foundation. JILA has evolved over the years into one of a handful of world class research facilities in astrophysics and has contributed immensely to our basic understanding of physical measurements.

Collaboration between the National Bureau of Standards, which has developed considerable research experience and capability in automated manufacturing technologies, and those NSF Engineering Research Centers which are pursuing research on related aspects of manufacturing sciences is to be encouraged. Also, the Committee encourages closer ties among NSF supported university research efforts in process metallurgy, which is relevant to steelmak-

ing, and the federal laboratories involved in the DOE/NBS Steel Initiative.

V. OVERSIGHT ACTIVITIES

Pursuant to Rule XI, Clause 2(l)(3)(A), and under the authority of Rule X, Clause 2(b)(1) and clause 3(f), of the Rules of the House of Representatives, the following statement on oversight activities is made:

Committee oversight of the National Bureau of Standards from April 26, 1986 through April 1987 has consisted primarily of hearings, inspection of the NBS facilities at Gaithersburg, Maryland and Boulder, Colorado; staff attendance of NBS meetings and briefings; and informal discussion between Committee Members, staff and NBS representatives.

The Committee's oversight findings and recommendations are contained in the body of the Report.

Hearings

An authorization hearing was held on March 3, 1987 in Washington, D.C. Testimony was given by Director Ambler, accompanied by the Deputy Director and the four laboratory Directors of the Gaithersburg, Maryland facility. Other witnesses included the current Chairman of the NBS Visiting Committee, and expert witnesses from the business community.

Inspection of NBS Facilities

Committee staff visited the research facilities in Gaithersburg, Maryland several times during the year to view the cold neutron facility and the automated manufacturing facility, and to participate in a variety of special programs. Also, in April 1987, staff made a site visit to the Boulder, Colorado research facilities.

Attendance at NBS Meetings

Members and staff of the Committee have met with NBS staff to receive various briefings on budget and program matters during the year.

Plans

During the coming year, the Committee plans for oversight include review of selected programs and projects of the NBS.

VI. OVERSIGHT FINDINGS AND RECOMMENDATIONS BY THE COMMITTEE ON GOVERNMENT OPERATIONS

No statement of findings and recommendations on oversight activity have been submitted by the Committee on Government Operations for inclusion in the report, pursuant to Rule X, Clause 2(b)(2), and Rule XI, Clause 2(l)(3)(D) of the Rules of the House of Representatives.

VII. BUDGET ANALYSIS AND PROJECTION

The bill provides no new budget authority or tax expenditures. Consequently, the provisions of section 308(a) of the Congressional Budget Act are not applicable.

VIII. COST ESTIMATE OF CONGRESSIONAL BUDGET OFFICE

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, May 14, 1987.

Hon. ROBERT A. ROE,
Chairman, Committee on Science, Space and Technology,
Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for H.R. 2160, the National Bureau of Standards Authorization Act for Fiscal Year 1988.

If you wish further details on this estimate, we will be pleased to provide them.

With best wishes,
Sincerely,

EDWARD M. GRAMLICH,
Acting Director.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 2160.

2. Bill title: National Bureau of Standards Authorization Act for Fiscal Year 1988.

3. Bill status: As ordered reported by the House Committee on Science, Space and Technology, May 13, 1987.

4. Bill purpose: H.R. 2160 authorizes appropriations for fiscal year 1988 for the various programs of the National Bureau of Standards (NBS) and other programs within the Department of Commerce. In addition to the specific amounts provided, the bill authorizes for fiscal year 1988 such sums as may be necessary for adjustments in salary, pay, retirement, and other employee benefits which may be provided for by law. The bill also contains a number of other provisions pertaining to programs of the NBS and the Department of Commerce.

The total fiscal year 1988 amount specifically authorized in the bill for the NBS is $145.0 million. The President's request for the NBS in 1988 is $138.6 million.

5. Estimated cost to the Federal Government:

[By fiscal years, in millions of dollars]

	1988	1989	1990	1991	1992
Authorizations:					
Specified (function 370):					
NBS	145.0				
Other commerce programs	3.9				
Subtotal	148.9				
Estimated (function 920)	1.9				

[By fiscal years, in millions of dollars]

	1988	1989	1990	1991	1992
Total authorizations	150.8				
Estimated outlays	117.1	30.5	3.2		

Basis of Estimate

For purposes of this estimate, it was assumed that the amounts authorized in the bill would be appropriated prior to the beginning of fiscal year 1988. The increases for salary, pay, retirement and other employee benefits required by law for 1988 are estimated consistent with the CBO baseline projections. Outlays reflect historical spending patterns for the programs involved.

6. Estimated cost to State and local governments: None.
7. Estimate comparison: None.
8. Previous CBO estimate: None.
9. Estimate prepared by: Carol Cohen.
10. Estimate approved by: C.G. Nuckols (for James L. Blum, Assistant Director for Budget Analysis).

IX. EFFECT OF LEGISLATION ON INFLATION

The anticipated inflationary impact of this legislation has been assessed in accordance with Rule XI, Clause 2(1)(4) of the Rules of the House of Representatives. No inflationary effect on prices and costs in the national economy is expected.

Expenditures by the National Bureau of Standards are, with few exceptions, for basic and applied measurements and standards related research within the Bureau's laboratories.

These enhanced R&D capabilities will encourage expansion of existing links between the Bureau's scientists and laboratories and industries. This will provide for more effective transfer of innovative research findings into the industrial sector. In this manner both national industrial productivity and competitiveness will be improved.

A number of economic studies have directly and indicated that the contribution of basic and applied research and development and innovation to economic growth, increased productivity, and favorable international trade balance is high. Increased productivity and comparative advantages in international trade are generally regarded as very effective measures in combatting inflation.

While there is a time lag and a degree of uncertainty in the innovation process from the conceptualization of an idea in research setting to the commercialization of a new product or process, the importance of R&D in the innovation process and its ultimate impact upon industrial productivity cannot be denied. This has been a major premise in the establishment and continued funding of the Bureau.

X. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of Rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

ACT OF MARCH 3, 1901

* * * * * * *

SEC. 2. The Secretary of Commerce (hereinafter referred to as the "Secretary") is authorized to undertake the following functions:

(a) * * *

* * * * * * *

(f) Invention and development of devices to serve special needs of the Government.

In carrying out the functions enumerated in this section, the Secretary is authorized to undertake the following activities and similar ones for which need may arise in the operations of Government agencies, scientific institutions, and industrial enterprises:

(1) * * *

* * * * * * *

(17) perform research to develop standards and test methods to advance the effective use of computers and related systems and other equipment, procedures, and systems for automatic acquisition, storage, manipulation, display, and transmission of information, and its use to control machinery and processes, and to protect the information stored, processed, and transmitted by those systems;

[17] *(18)* the operation of a laboratory of applied mathematics;

[18] *(19)* the prosecution of such research in engneering, mathematics, and the physical sciences as may be necessary to obtain basic data pertinent to the functions specified herein; and

[19] *(20)* the compilation and publication of general scientific and technical data resulting from the performance of the functions specified herein or from other sources when such data are of importance to scientific or manufacturing interests or to the general public, and are not available elsewhere, including demonstration of the results of the Bureau's work by exhibits or otherwise as may be deemed most effective:, and including the use of National Bureau of Standards scientific or technical personnel for part-time or intermittent teaching and training activities at educational institutions of higher learning as part of and incidential to their official duties and without additional compensation other than that provided by law.

* * * * * * *

SEC. 19. The Director shall keep the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate fully and

currently informed with regard to all of the activities of the National Bureau of Standards.

XI. COMMITTEE RECOMMENDATION

A quorum being present, H.R. 2160 was ordered favorably reported by the Committee on May 13, 1987 by voice vote.

XII. ADMINISTRATION VIEWS

THE SECRETARY OF COMMERCE,
Washington, DC. March 27, 1987.

Hon. JIM WRIGHT,
Speaker of the House of Representatives,
Washington, DC.

DEAR MR. SPEAKER: Enclosed are six copies of a draft bill to authorize appropriations to the Secretary of Commerce for the programs of the National Bureau of Standards for fiscal years 1988 and 1989, and for other purposes.

We have been advised by the Office of Management and Budget that there is no objection to the submission of this legislative proposal to the Congress, and that its enactment would be in accord with the program of the President.

Sincerely,

MALCOLM BALDRIGE,
Secretary of Commerce.

Enclosures.

A BILL To authorize appropriations to the Secretary of Commerce for the programs of the National Bureau of Standards for fiscal years 1988 and 1989, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Bureau of Standards Authorization Act for Fiscal Years 1988 and 1989."

AUTHORIZATION FOR PROGRAM ACTIVITIES

SEC. 2. There are authorized to be appropriated to the Secretary of Commerce, hereinafter referred to as the Secretary, to carry out activities performed by the National Bureau of Standards, the sums set forth in the following line items:

(a) Measurement Research and Standards, $43,196,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989.

(b) Materials Science and Engineering, $24,557,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989;

(c) Engineering Measurements and Standards, $35,347,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989;

(d) Computer Science and Technology, $8,266,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989; and

(e) Research Support Activities, $27,259,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989.

OFFICE OF PRODUCTIVITY, TECHNOLOGY AND INNOVATION

SEC. 3. In addition to the sums authorized to be appropriated in section 2 of this Act, there are authorized to be appropriated to the Secretary, $1,900,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989 to carry out activities performed by the Office of Productivity, Technology, and Innovation.

SALARY ADJUSTMENTS

SEC. 4. In addition to the sums authorized to be appropriated by Sections 2 and 3 of this Act, there are authorized to be appropriated to the Secretary for fiscal years 1988 and 1989 such additional sums as may be necessary to make any adjustments in salary, pay, retirement, and other employee benefits which may be provided for by law.

AVAILABILITY OF APPROPRIATIONS

SEC. 5. Appropriations made under the authority provided in this Act shall remain available for obligations, for expenditure, or for obligations and expenditure for periods specified in the Act making such appropriations.

CONTRIBUTIONS

SEC. 6. The National Bureau of Standards is authorized to accept contributions of funds, to remain available until expended, from any public or private source to construct a facility for cold neutron research on materials, notwithstanding the limitations contained in 15 U.S.C. § 278d.

NATIONAL TECHNICAL INFORMATION SERVICE

SEC. 7. Section 2 of the Act of September 9, 1950, c. 936, 64 Stat. 823 (15 U.S.C. § 1152) is amended by inserting after the word "reproductions" in subsection (b) thereof the words "without regard to section 501 of title 44, United States Code."

STATEMENT OF PURPOSE AND NEED

This bill authorizes appropriations to the Secretary of Commerce for fiscal year 1988 and fiscal year 1989 to carry out activities performed by the National Bureau of Standards (NBS) and the Office of Productivity, Technology, and Innovation (OPTI), clarifies NBS' authority to receive private contributions for its Cold Neutron Research Facility, and exempts the National Technical Information Service (NTIS) and its contractors from 44 U.S.C. § 501.

The NBS, the nation's oldest national laboratory, is the primary Federal agency dedicated to measurement science and standards. Created by the Act of March 3, 1901 (Pub. L. No. 56-177, 15 U.S.C. §§ 271-278h) (hereinafter the "NBS enabling act"), NBS is charged with developing a basic measurement foundation for U.S. industry, science, and government. It does this by creating and disseminating

accurate methods of measurement, evaluated technical data and standards, and guidance on using these measurement tools.

Accurate, standardized measurement methods and data are essential to the quality and cost competitiveness of American industry. They are equally vital in all segments of the industrial economy from new technologies such as advanced ceramics, croelectronics, optoelectronics and biotechnology to more familiar fields such as communications, steel, and chemicals. They can shorten the time between laboratory success and profitable product introduction.

NBS' primary activities include developing calibrations, standard reference materials, and standard reference data. In addition to providing this information to American industry and the standards community, NBS promotes agreement on international codes and standards, supports state weights and measurement programs, and makes special facilities and test beds available for private use. NBS and OPTI also promote technology transfer through publications, workshops and conferences.

Public Law No. 99-574, dated October 16, 1986, authorized appropriations to the Secretary of Commerce for fiscal year 1986 for all NBS' activities and operations, including those performed under the NBS enabling act and other statutes such as the Standard Reference Data Act (Pub. L. No. 90-396, as amended; 15 U.S.C. §§ 290-290f). It also authorized appropriations for fiscal year 1987 for activities of the Assistant Secretary of Commerce for Productivity, Technology and Innovation. It expires on September 30, 1987.

This bill would extend the authorization of appropriations for the programs and activities of NBS and OPTI for fiscal year 1988 and fiscal year 1989. In addition, it would authorize NBS to accept contributions of funds from any public or private source to construct a facility for cold neutron research on materials. Finally, the bill would allow NTIS and its contractors to procure printing services from private vendors. Presently, NTIS is required to procure its printing from the Government Printing Office (GPO). Freeing NTIS's contractors from any requirement to use the GPO would be consistent with the Administration's desire to remove obstacles that would affect the private sector's ability to perform NTIS's activities under Government contract.

Section-by-Section Analysis

Section 1 provides that this bill may be cited as the "National Bureau of Standards Authorization Act for Fiscal Years 1988 and 1989."

Section 2 authorizes fiscal year 1988 and 1989 appropriations to the Secretary of Commerce for the activities of the National Bureau of Standards (NBS).

Subsection 2(a) authorizes $43,196,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989 for Measurement Research and Standards. Research in physics, radiation, analytical chemistry, and chemical properties and processes produces fundamental measurement knowledge which enables industry and science to achieve levels of accuracy and compatibility that they require in the laboratory, during production, and in buying and sell-

ing. For example, very precise measurement of the speed of light and laser frequencies has allowed NBS to tie all measurements of time, frequency and length to a single, very precise standard. The new definition allows the radiation from recommended stabilized lasers to be used for dimensional measurements in the user's own facility, thus improving process quality and enhancing productivity.

Subsection 2(b) authorizes $24,557,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989 for Materials Science and Engineering. Research in materials characterization, nondestructive evaluation, metallurgy, metals processing, polymers, and ceramics produces organized data and technical know-how which permit more rapid industrial adoption of new materials that contribute to improved productivity and competitiveness. For example, NBS is developing measurement techniques, data, theory and predictive models related to the rapid solidification of metal powders thus removing roadblocks to the application of these materials in high-speed machine tools, engines for aircraft, and turbines for power generation.

Subsection 2(c) authorizes $35,347,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989 for Engineering Measurements and Standards. Research in electronic and electrical measurements, chemical engineering, manufacturing engineering, mathematical sciences, construction and performance of buildings and fire prevention produces engineering knowledge and databases for design, development, prediction and control of industrial processes. Objectives of research are improved quality assurance and efficiency of manufacturing processes and include the prediction of the effects of changes in the process, its materials and interfaces. For example, the quality assurance focus in industry is driving NBS's Automated Manufacturing Research Facility, where a multimillion dollar cooperative effort with numerous industrial and academic partners has resulted in concepts of the human-machine interaction in the machining process.

Subsection 2(d) authorizes $8,266,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989 for Computer Science and Technology. Research in computer science and engineering establishes government-wide automated data processing (ADP) standards and provides technical support for the development of national and international voluntary industry standards which lead to more productive use of computers and networks, and to maintenance of the competitive posture of the U.S. computer industry. For example, NBS, in cooperation with computer manufacturers and users, is developing standards and test methods for the integration of hardware, software, and network systems, the interchange of data between systems, and data security.

Subsection 2(e) authorizes $27,259,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989 for Research Support Activities. This subactivity groups centrally managed programs that provide support to all other NBS programs. This support includes developing technical competence in NBS mission oriented areas of research and services, providing scientists and engineers from industry and universities the opportunity to participate in the Research Associates program, providing computing support

to NBS programs, maintaining a satisfactory facilities environment for conducting the NBS technical programs, constructing a cold neutron research facility for advanced materials research and formulating and implementing product standards policy and guidelines related to international standardization and legal metrology. These items include NBS activities authorized by the Act of March 3, 1901 (NBS' basic enabling statute) and by other statutes, such as the Standard Reference Data Act.

Section 3 authorizes an appropriation to the Secretary of Commerce of $1,900,000 for fiscal year 1988 and such sums as may be necessary for fiscal year 1989 for the activities of the Office of Productivity, Technology and Innovation (OPTI). The Administration proposes to reduce OPTI's activities during fiscal year 1988. This authorization includes funds for a reduced staff and for phase down activities. OPTI will continue to advise the Secretary, the Under Secretary, and other government officials on matters of policy regarding productivity, technology, and innovation.

Section 4 authorizes the appropriation of such additional sums as may be necessary for fiscal years 1988 and 1989 to make any adjustments in salary, retirement, and other employee benefits which may be provided for by law.

Section 5 specifies that funds appropriated under this bill shall remain available for obligation, for expenditure, or for obligation and expenditure for the periods of times specified in appropriation acts. This section assures NBS and OPTI of the availability of appropriated funds for expenditure for its research programs and provides the necessary flexibility for NBS' administration of its scientific and engineering research programs.

Section 6 would allow NBS to accept and retain contributions of funds from the public and private sectors to be used to construct a Cold Neutron Research Facility at the NBS Reactor. The Senate Committees on Appropriations and Commerce, Science and Transportation have encouraged NBS to seek contributions from the industrial sector and other Federal agencies for its proposed Cold Neutron Research Facility. This language clarifies NBS' authority to retain any contributions, regardless of fiscal year, until needed as construction of the facility takes place. Similar language is contained in Section 104 of Pub. L. No. 99-500, the Fiscal Year 1987 Continuing Appropriations Act.

Section 7 provides NTIS and its agents with authority to procure printing services from private vendors. Section 501 of title 44, United States Code, requires NTIS to procure its printing services through the Government Printing Office (GPO). The Department of Commerce plans to offer the private sector the opportunity to perform NTIS's functions while retaining overall policy direction. This section is intended to allow NTIS and its contractors to procure printing services at the most cost effective rate by freeing them from any requirement to use the GPO. This is consistent with the Administrations' desire to remove obstacles that would affect the private sector's ability to perform NTIS's activities under Government contract.

XIII. MINORITY VIEWS

The National Bureau of Standards (NBS) FY88 budget, as reported by the Committee, is $4.4 million over the Administration request. This is in spite of the 14 percent increase provided for by the Administration, which we believe is a substantial and welcomed increase. The FY88 proposed budget is a positive response to the Committee's urging of the Department of Commerce to focus attention on NBS, our oldest laboratory. When we speak of competitiveness, NBS has perhaps the strongest link to industry.

In a country that depends on industry adopting voluntary private sector standards, we obviously need NBS as the guiding light. To compete with other countries for quality, we do need to insist on better and timely standards. We believe that NBS is doing just this. Furthermore, this goal can be achieved by the Administration's requested level of $138.6 million, and at the same time, it is feasible to restore the fire and building funds ($4.4 million) from within the FY88 requested level.

It is for this reason that such an amendment was offered in Full Committee. Unfortunately, the amendment was not adopted.

The amendment fulfilled Congress's commitment to maintain the Center for Fire Research and the Center for Building Technology at the program levels agreed to last year with the Office of Management and Budget (OMB). It maintained the two additional budget floors in the Subcommittee recommendation—$2 million for steel and $7,371,000 for the Competence Fund, which is needed for the Director to respond to unanticipated, innovative research proposals. Further, it funded the Cold Neutron Facility at the $6.5 million level requested by the Administration. Finally, it provided the Bureau the discretion as to how to distribute the $4.4 million reduction.

The Minority proposal certainly was consistent with past Committee activity, when the Committee did not have an increased budget proposal to work from, as well as, consistent with fiscal responsibility.

MANUEL LUJAN, JR.
D. FRENCH SLAUGHTER, JR.
F. JAMES SENSENBRENNER, JR.
HARRIS W. FAWELL.
PAUL B. HENRY.
JACK BUECHNER.
RON PACKARD.